

REMARKS/ARGUMENTS

Claims 2-6, 8-11, 14, 15, 22, 24-33, 41-44, and 46-49 are currently being examined in the present patent application, with claims 1, 19-21, and 45 having been cancelled through the above claim amendments and the remaining ones of the claims having been withdrawn.

Before discussing the substance the response to the Office Action mailed September 11, 2007, it should be noted that this amendment is being filed after having filed a second Request for Continued Examination (RCE) in the present application. Accordingly, should the Examiner consider any of the claims not in condition for allowance upon review of the present amendment, the undersigned requests the Examiner to contact him at (425) 455-5575 to arrange for a telephone interview to discuss and most efficiently resolve any outstanding issues.

In the Office Action, which is the first after having filed the second RCE, the Examiner rejects claim 46 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,807,789 to Chen *et al.* ("Chen") and rejects claims 47-49, 2-6, 8-11, and 14-15 as being obvious in view of Chen and various other cited references. Notwithstanding all the reasons, including the objective prior art references, provided by the undersigned in the prior amendment, the Examiner maintains his position that Chen teaches varying an etching voltage between the plasma and the wafer. See page 6 of the Office Action.

While the undersigned does not agree that Chen discloses varying the etching voltage as asserted by the Examiner, claim 2 has nonetheless been amended to recite, in part, applying a wafer voltage to the semiconductor wafer and controlling the wafer voltage applied to the semiconductor to thereby control an etching voltage between a plasma around the wafer and the wafer. This language is clearly supported in paragraphs 25 and 26 that describe the signal diagram of Figure 17 and embodiment of Figure 16, which is covered by amended claim 2.

As discussed in the previous amendment, paragraph 25 of the present application, for example, explains that plasma etching is performed by placing the wafer 20 in an etching chamber 32 in which a known mixture of gases flows in predetermined conditions of temperature, pressure and flow. See Figure 16. In addition, the etching chamber 32 is set at a chamber voltage VC while the wafer 20 is kept at a wafer voltage VW. The plasma, coming into contact with the etching chamber 32, reaches a plasma voltage VP higher by a known amount than the chamber voltage VC. An etching voltage $VE = VP - VW$ is present between the exposed surface of the wafer 20 (more specifically, of the substrate 21) and the plasma. This etching voltage VE is controllable through the wafer voltage VW and the rate of removal of the silicon and the rate of microdeposition of the polymeric material of the plasma are a function of the etching voltage VE. In particular, all other conditions being equal, the rate of microdeposition increases as the absolute value of the etching voltage VE increases.

Chen only refers to RF power, which is power supplied to a gas mixture to create a plasma and which is the conventional and well understood meaning of RF power. Indeed, the RF power is necessary to bring the gas mixture into the plasma state and varying the RF power changes plasma conditions. The RF power does not, however, affect the etching voltage, which in turn determines the energy of ions leaving plasma to reach the wafer. As evidenced by References A-D, the etching voltage is a separate parameter in plasma etching systems to provide an independent control of ion energy of ions reaching the wafer. In addition, controlling the etching voltage modifies only ion energy and does not have any substantial impact on plasma stability, which is of importance to control. To the contrary, RF power changes cause transients and instability in the plasma that harm fine control of etching conditions.

Chen neither discloses nor suggests controlling the wafer voltage applied to the semiconductor to thereby control an etching voltage between a plasma around the wafer and the wafer in combination with the other recited elements. Neither does Chen in combination with any of the cited references disclose or suggest the

combination of elements recited in amended claim 2. Accordingly, Chen is allowable to reasons similar to the reasons discussed with reference to independent claim 24 in the prior amendment, and claim 24 was allowed by the Examiner in the Office Action.

For at least these reasons, the combination of elements recited in independent claim 2 is allowable. Dependent claims 3-6, 8-11, 14, and 15 are allowable for at least the same reasons as claim 2 and due to the additional limitations added by each of these claims.

Independent claim 46 recites, in part, a method for forming trenches with an oblique profile and rounded top corners in a wafer that includes controlling an etching voltage between a plasma around the wafer and the wafer by varying the wafer voltage applied to the semiconductor wafer. The combination of elements recited in claim 46 is accordingly allowable for at least these reasons since Chen nor the other references of record disclose or suggest the recited elements. Dependent claims 47-49 are allowable for at least the same reasons as claim 46 and due to the additional limitations added by each of these dependent claims.

\\

\\

\\

\\

\\

\\

\\

\\

\\

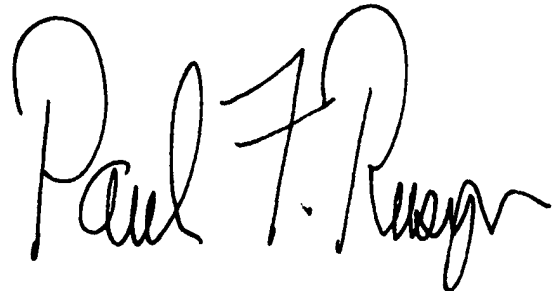
\\

\\

The present patent application is in condition for allowance. Favorable consideration and a Notice of Allowance are respectfully requested. **Should the Examiner have any further questions about the application, Applicant respectfully requests the Examiner to contact the undersigned attorney at (425) 455-5575 to arrange for a telephone interview to discuss the outstanding issues.** If the need for any fee in addition to any fee paid with this response is found, for any reason or at any point during the prosecution of this application, kindly consider this a petition therefore and charge any necessary fees to Deposit Account 07-1897.

Respectfully submitted,

GRAYBEAL JACKSON HALEY LLP

A handwritten signature in black ink, appearing to read "Paul F. Rusyn". The signature is fluid and cursive, with the first name "Paul" being the most prominent.

Paul F. Rusyn
Registration No. 42,118
155 – 108th Avenue NE, Suite 350
Bellevue, WA 98004-5973
(425) 455-5575 Phone
(425) 455-5575 Fax